

# Causes for Degradation to Chunati Wildlife Sanctuary and Its Restoration Strategy

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**Abstract:** - The purpose of the study is to identify the Causes for the Degradation to Chunati Wildlife Sanctuary (CWS) and its restoration strategy. Besides this, the study also highlighted the issues in forest management and biodiversity conservation and identify the challenges for the CWS. This forest is seriously degraded and most parts of it are now denuded. Natural forest cover is confined in a few small pockets and represented by few scattered trees nearby the forest offices only. The forest is now dominated by herbs, shrubs and sun grass. Agricultural activities have also increased. Land encroachment has increased by 80% compared to 1970 level. This research study is descriptive-cum-empirical as well as suggestive in nature. The study is survey type. The present study has been included secondary resources consisting of books, newspapers, periodicals, articles from national and international level. Internet sources have been used for the research. Attempts have been made to include the latest information whenever available. At the same time primary data have been collected through interview with some officials and experts on the topic. Baseline data was collected from January to April in 2019. The study shows that highest about 80% HHs depend on forest fuel wood, bamboo and sun grass, followed by fruits (8%), cane (5%), bark of trees (2%), vegetables (5%). Besides, stone and sand also are collected from CWS. About 86% HHs informed that they collect it directly from forest and in 14% cases they purchase or collect it from others. Land encroachment leading to expansion of settlements and agriculture, tree poaching, hunting, collection of fuel wood, bamboo and cane, and other forest products are the major causes for the degradation of the forest and its resources. Poor forest management by FD, local deteriorating law and order situation, adverse role of the local influential people, operation of brickfield and sawmills, local unemployment and poverty are the major underlying factors that contribute to the forest degradation. Finally, it may be concluded that there is an urgent need to strengthen the local FD in the Sanctuary with adequate and skilled manpower with modern weapons and vehicles and to capacitate them in dealing with co-management of Protected Areas, establishment of a buffer sustainable resource use zone around the PA with provision for fuel wood plot, woodlot and other plantations required for house building purposes, appropriate, site specific and technically sound management. Action Plans should be developed with consultation of local people, betel leaf cultivation should be stopped within the sanctuary area, poor resource users should be identified and brought under AIG program with provision that they give up the unsustainable use of forest resources.

**Keywords:** Degradation, Protected Area, Wildlife Sanctuary, Resources, Biodiversity.

## I. BACKGROUND

The Chunati Wildlife Sanctuary is a tropical semi-evergreen forest in Bangladesh, situated at about 70 km south of Chittagong city on the west side of Chittagong-Cox's Bazar Highway. The GPS locations for the sanctuary are 21040/ N and 92007/ E. The sanctuary embraces partly 7 unions (namely Chunuti, Adhunagar, Herbang, Puichari, Banskhal, Borohatia, Toitong) of Banskhal and Lohagara Upazila of Chittagong District and Chokoria Upazila of Cox's Bazar District. Earlier, the sanctuary was under the jurisdiction of Chittagong (south) Forest Division, but in the recent past, it has been transferred to the newly created Wildlife and Nature Conservation Division of the Forest Department. Administratively, the sanctuary is divided 2 Forest ranges, Jaldi and Chunati, 7 Forest Beats (namely, Chunati, Herbang, Aziznagar, Jaldi, Puichari, Chambol and Napor) and further divided into 7 forest blocks. Chunati WS was formally established through a Gazette Notification in 1986 under the provision of Wildlife preservation Act. As per the Gazette Notification the Wildlife Sanctuary covers an area of 7763.94 ha or 19177 acres. There are 7 mouzas, divided into 15 villages and further divided into about 70% settlements (locally called para). Of the paras, about 48% is located inside and at the edge of the forest and the rest are located outside, but adjacent and nearby the forest. In the Chunati Range, there are about 7810 HHs and a population of approximately 50000. The sanctuary area is generally hilly to mountainous with shallow to deep gullies and gentle to steep slopes. The average elevation is 30 to 90 M. There are numerous creeks, which are clear with gravely, and stony beds, which traverse the area. The forest is covered by about 890 ha bush, 84 ha garjan forest, 13 ha small crown high forest, 11 ha open, 1458 ha plantation, 2761 scattered area and 9 ha water bodies.

It is a tropical semi evergreen forest is in the Garjan belt, which extends from Chittagong to Cox's Bazar and originally there was a rich Garjan Forest with natural associates of Garjan in the area. The associate trees include Rakten, Jam, Urium, Chaplains, Simul, Koroi, and wide variety of other species. Besides this various species of trees, bamboos and grasses were also profuse in the sanctuary, but due to various causes, like unauthorized cutting and indiscriminate illicit felling, the species are being restricted now, stock is very poor. Approximately, 1200 plant species, which include 45 species of trees and rest are herbs and shrubs, are present now.

A total of 178 species wildlife species found in the sanctuary which include 6 amphibians, 8 reptiles, 137 birds and 27 mammals. The Government since 1972 bans systematic and legal harvesting of major forest produces. Illegal harvesting of firewood, poles, bamboo, canes, and sun grass however continues. Both people from the inside paras as well from adjacent paras are mainly involved with resource exploitation from the WS. Settlements and the pressure of human living in and around of the Wildlife Sanctuary are increasing day by day. Forests resources are decreasing for many causes. This study tries to identify the causes of forest degradation.

*Objectives*

The purpose of the study is to identify the Causes for the Degradation to Chunati Wildlife Sanctuary and its restoration strategy. Besides this, the study also highlighted the issues in forest management and biodiversity conservation and identify the challenges for the CWS. Finally, the study put forward set recommendations for the improved management of the sanctuary.

II. METHODOLOGY

Research methodology is a collective term for the structured process of conducting research. It usually encompasses the procedures followed to analyze and interpret the data gathered. This research study is descriptive-cum-empirical as well as suggestive in nature. The study is survey type. The present study has been included secondary resources consisting of books, newspapers, periodicals, articles from national and international level. Internet sources have been used for the research. Attempts have been made to include the latest information whenever available. At the same time primary data have been collected through interview with some officials and experts on the topic. Baseline data was collected from January to April in 2019. Data were collected from the capital and the field level conducting interview, discussion and observation using primary source i.e. interview with the respondents from the selected study areas. Primary data were collected through interview. Data were also collected from secondary source through literature review i.e. reference books, newspapers, periodicals, articles from national and international level. Internet sources have been used for research. An attempt was made to include the latest information whenever available. The nature of the study requires combining analytical and empirical approaches in the methodology. Accordingly, both qualitative and quantitative information and data were required. In order to generate database of the study, all necessary information was collected from different primary and secondary sources. Data were also analyzed and presented through the use of necessary figures, tables and charts. In the empirical study field work plays an integral role. The study relied on four main data collection tools namely: in-depth interview guideline/checklist; observation of respondent, cross checking of data collected from field using mobile/telephone and review of related documents. All these tools are closely related. Although different approaches were applied in this study, the main

purpose was to ensure that they complemented each other. The findings were presented in table and narrative way because this article is both quantitative and qualitative in nature. The study area is Chunati Wildlife Sanctuary, under Bashkhali and Lohagara Upazila of Chittagong district of Bangladesh. Respondent of this study are Forest Departments, Teachers, Elites, fuelwood collectors, Co-management Committee, Community Patrolling Groups and Forest Villagers. They are age group were 25-40 years, 40-65 years, 65+ years. Forest resources like timber, fuelwood, bamboo, cane, sun grass, vegetables were selected for study. Sample Population was at least 50 from each Professional group balancing other variable criteria with sufficient diversity found. Secondary information i.e. references books, journals, research report, newspaper, magazines etc were used in this study. The sources have not been analyzed and explained. But this study was dependent on primary information i.e. face to face interview. Review of document has positive aspects. Knowledge explains the positive side of this approach; this method views the author as a self-conscious actor addressing an audience under particular social and political circumstances. Collected data were tabulated and analyzed by using computer program SPSS & Microsoft Excel.

III. RESULTS AND DISCUSSION

The results obtained from present research are sequentially produced here as per objectives. The results are given in the Tables and Fig.

**Table1.** Beat wise list of settlement having large involvement in resource collection from the WS

Name of Beat under Chunati Range	Name of villages/settlement
Chunati beat	Gucchagram, Rashiderghona, Lambakata, Ratarkool, Bonpukur, Hasainnakata, Suftrinagar, Nullbunia, Rosaingaghona, Tingoriapara
Aziznagar beat	Villagerpara, Baruapara, Jungle Bosti, Gainnakata,
Herbang beat	Bhandarir Dhoba, Brindabonkhil, Charpara, Goyalmara Villagerpara, Napiterchita

**Table2.** List of Local trading centers of forests resources like fuelwood, bamboo, sun grass, fruits and birds

- Raja bazar
- Adhunagar Bazar
- Herbang bazar
- Munsef bazar
- Deputy Bazar
- Banpukur Bazar
- Hazir Rasta
- Natun bazr
- Noya bazar
- Goyal mara station
- Bhandarir doba Bazar
- Aziznagar Bazar
- Chambi Bazar
- ITCL station
- Prem Bazr
- Banskhali
- Borohatia
- Chakaria

**Table3.** Summary information on resource exploitation in Chunati WS

SI	Name of resources	Reason for resource exploitation	Users	Extent	Dependency	Risks
1	Fuelwood	Both for commercial and HHs use, as main sources of fuel	Local people, tea stall & hotel owner, Brick fields	High	Moderate to high	High
2	Timber	Timber Commercial & HHs use as building materials	Local people, outsider, bandit group, syndicate, furniture shops owner	Moderate	Moderate High,	selectively the tall trees are feeling
3	Sungrass	Both for Commercial and HHs consumption as building materials	Local people	High	Moderate	Low but habitat of fox is decreasing
4	Bamboo	As raw material of handicrafts, poles, fencing, basket and others, fuel, poles for betel leaf cultivation	Local people, fisherman, beta leaf cultivator, outsider people	Moderate	Moderate	Moderate
5	cane	Commercial & HHs use for handicrafts	Local people, furniture makers	Less	Low	Low
6	Medicinal Plants	As medicine,	commercial consumption Outsider and traditional healer,	Less	Low	Low
7	Honey	Both commercial and HHs consumption, used as Food, medicine.	Local People	Less	Negligible	No risks
8	Herbs & shrubs	As vegetables and also as alternative of rope	Local People, small businessmen	High	Low	Low
9	Bird	Both Commercial and HHs consumptions, For meat (wild fowl, pigeon etc.)	Local People, Hunter	Very less	Very low	High risks
10	Deer	Commercial and HHs consumption for eating	Hunter,	Low	Low	High
11	Fruits	Maximum for HHs Consumption and also for Commercial purpose, as Food	Local People, Tribal Birds, Monkey	Very Less	Low	Less
12	Vegetables	HHs consumption as Food	Local People especially women and children	Less	Low	Less
13	Grass	Collected as fodder	Local People and cow boy	Less	Moderate	Less
14	Sand	Commercial purpose, Less Low Moderate	Influential person through	poor	day labor	High
15	Dry leaf	Both for HHs & commercial purpose	Children & women	High	Moderate	Low
16	Creek/water body/canal	Commercial purpose,	Fisherman and local people	Moderate	High	Low

A total of 16 major resources are exploited by the local people from Chunati Wildlife Sanctuary (CWS). Table3 provides information on the resources exploited, level of exploitation, major users and their dependency on the resources and the risks involved with the present level of exploitation. Out of 16 resources 4 are high risks, 9 are low and rest 3 are moderate risks.

**Table4.** Summary information on resources and percentage of forest dependency in Chunati WS

SI	Name of resources	% of forest dependency	Ranking
1	Forest fuelwood, bamboo and sungrass,	80	1
2	Fruits	7	2

3	Cane	5	4
4	Bark of trees	2	5
5	Vegetables	6	3
	Total	100	

Table-4 and Fig-1, illustrated data revealed from HH interviews during survey that highest about 80% HHs depend on forest fuelwood, bamboo and sungrass, followed by fruits (8%), cane (5%), bark of trees (2%),

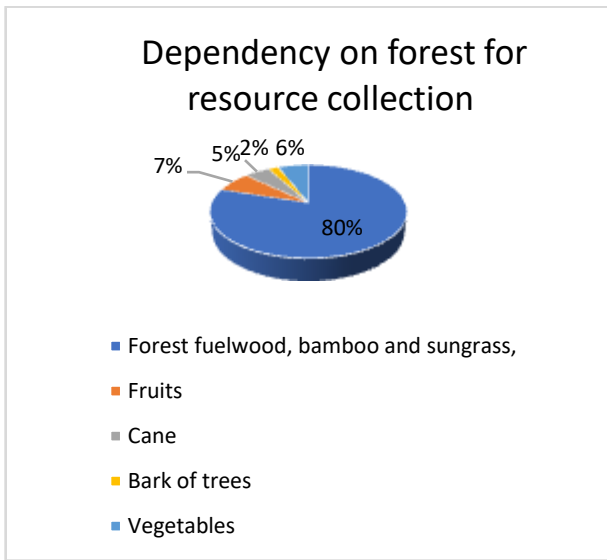


Fig-1: Dependency on forest for resource collection

Fuelwood, herbs & shrubs and sungrass are collected at a large extent while timber and bamboo are at a moderate extent and the rest are at a lesser extent from the WS. People depend moderately on the collection of timber, sungrass, bamboo and fodder etc. Collection of fuelwood, felling of trees, bamboo, wildlife etc. pose high to moderate risk to the biodiversity of the WS. Mainly the local people from inside and adjacent villages and forest villagers are involved with fuelwood, bamboo, sungrass collection. Middle class and rich people are not much directly involved with collection of these resources. Resources are collected both for HH consumption and as well as for commercial purposes. Cause-effect analysis (Table4) shows that local level poverty, additional income needs, unemployment, scarcity of some resources drive the local people, particularly the poor to exploit the resources from the WS. Poor forest patrol and negotiation with elicit fellers is mainly responsible for tree felling. Land encroachment is mainly done by powerful and influential people.

**Table 5.** Cause and Effect–Ranking (understanding underlying factors for resource extraction)

Name of resources	Timber to sell	Fuelwood collection	Bamboo and cane sell	Land encroachment	Hunting
Identified problems					
Poverty	60%	60%	40%	60%	20%
Unemployment	40%	80%	20%	20%	20%
Additional income needed	60%	40%	40%	20%	20%
No resource for house building	20%		80%	60%	
Forest cases	60%	20%		40%	20%
Income opportunities squeezed		60%			
HHs consumption	20%	100%	60%	80%	20%
Poor forest patrol	60%	20%	40%		20%
Easy negotiation	60%	20%		100%	
Lack of control over forest by FD	60%	20%	20%	80%	
Transportation development	40%	20%	20%	40%	
Natural calamities	40%	20%	20%		
Burning hills	40%	60%	20%	80%	20%
Traditional practice	20%	60%	20%	60%	60%
Involvement of influential people	100%			100%	40%
Emerged as new income generation activity.	20%		20%		
Brick field	40%	100%			
Saw mill	80%				
Betel leaf			80%	80%	

*Fuelwood extraction*

**Table 6.** Summary information on purpose of fuelwood collection in Chunati WS

Sl	Purpose of fuelwood collection	% of use	Ranking
1	HH consumption	60	
2	Commercial purposes	40	

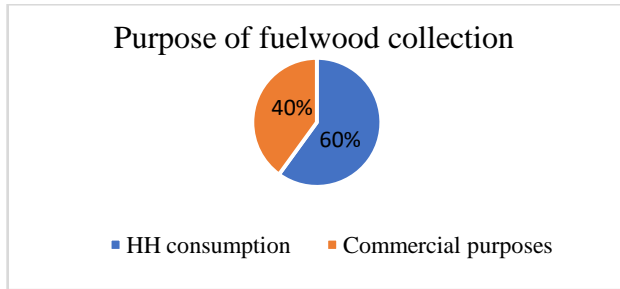


Fig-2: Purpose of fuelwood collection

Table 6 and Figure 2 illustrated that about 60% HHs collect resources from forest for HH consumption and the rest 40% for commercial purposes. However, majority HHs of inside villages collect it for both reasons.

All fuelwood requirements of inside HHs and at least partial demand of HHs in adjacent villages are met from the forest. Besides, fuelwood collections provide primary and secondary occupation for many HHs. Mainly children, women and poor people collect fuelwood. A huge quantity of fuelwood is used in local brickfields and substantial quantity of fuel is transported to other areas. Fuelwood collection takes place in all seasons, but predominantly during dry season. Usually they cut the tree branches, canopies and even fell the newly planted tree, stamps and bring it after few days when it gets dead appearance. This poses a threat to the forest and its biodiversity.

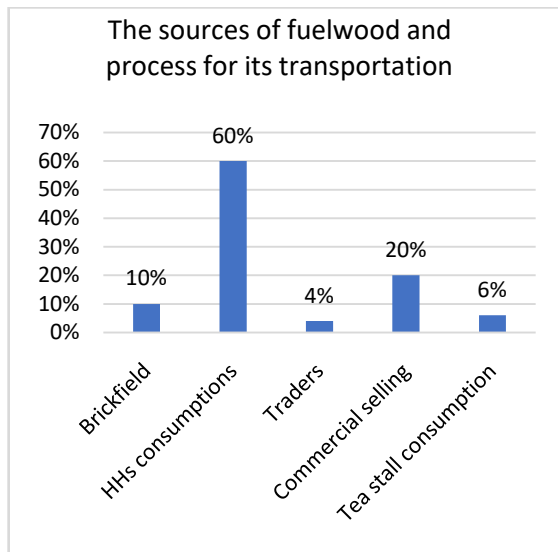


Fig-3: The sources of fuelwood and process for its transportation

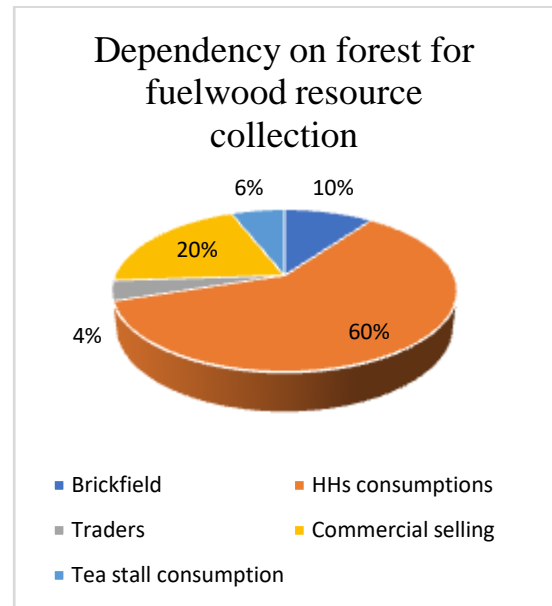


Fig-4: Dependency on forest for resource collection

**Table7:**Dependency on forest for fuelwood resource collection.

Source of fuelwood consumption	% of fuelwood consumption	Remarks
Brickfield	10%	Third
HHs consumptions	60%	First
Traders	4%	Fifth
Commercial selling	20%	Second
Tea stall consumption	6%	Forth

Mainly children, women as well as poor day labor, adult and in some cases, old people also involved in this activity. Fuel wood collection has a serious negative impact on forest and its biodiversity. It seriously hampers forest regeneration, reduce vegetation cover leading to habitat degradation. However, this is not felt by the thought the FD staff and local people found no impact on forest but in fact for these activities, forest is decreasing, natural regeneration is not occurring, several planted sapling is damaging, wild life is losing their food bearing trees.

*Illegal tree felling;*

Widespread tree felling in the past contributed to the qualitative and quantitative reduction in forest and its resources. Illegal tree felling is still going on. However, unavailability of suitable trees has led to the reduction in the activity. Some trees are also collected as building material by local people. Still tree felling remains as a major threat. Mainly adult, as well as poor day labor, and in some cases the old people also involved in this activity. In most cases, the illegal fellers come from outside of the WS area, mainly from Borohatia and Banskhali. However, some local people as well as forest villager help them in this activity. In most cases, they enter into forest in groups for illegal tree felling. They usually carry out this activity at night, but sometimes in day

time during longtime GoB vacation. Almost all of the illicit fellers are poor and their livelihoods are dependent on this activity. Timber merchant, local political and influential persons are indirectly involved in tree felling. Sometimes, local influential people engage poor villager in tree felling on a daily basis. Many local HHs also collect small trees as building material for their houses. In some cases, Headman (Head person of forest villages) and forest villagers are involved in tree felling and have a strong negotiation with the syndicate and FD. The major markets for illegal timber trading are Toitang, Rajarbazar and Adhunagar bazar. Illegal timbers are also traded many places nearby local market places. Timber is also transported to Chittagong and Dhaka. In some cases, the illegal fellers are so powerful that they override the local forest guards and staffs.

*Bamboo and cane collection:* Bamboo is collected by the both local poor and betel leaf cultivator both for commercial and HH consumption. The local people use bamboo as building material, fencing, handicrafts, betel leaf cultivation and fuel wood. Bamboo is also collected for commercial purposes. Presently, a huge quantity of bamboo is used in betel vineyards used. Presently, bamboo is distributed in limited areas of the WS, mainly in eastern side of the Jaldi range. In Jaldi are some women are engaged in handicrafts production by using bamboo and cane. Although, FD has plantation programs of these two resources, the natural regeneration of bamboo and cane has become very limited and posed a great threat to its future availability. At present, cane is near about extinction from the WS due to over exploitation and burning the hills for claiming land for plantation and also for betel leaf cultivation.

#### *Hunting and killing of wildlife*

Widespread hunting existed in the past. However, still it is going on a very limited scale. In particular, deer, birds, jungle fowl, mothura, turtles, wild boar etc. are hunted. There is a hunter group in Chunati, and have their own licensed gun. As reported about 45 licensed guns are possessed by the group. On the other part of the WS, in Jaldi side, there is also a similar group of hunters. They are mainly interested in deer hunting. As a tradition of Chunati village, at least once in a year they are used to go for collective hunting. They are still active, but not like earlier. The surveyor met a hunter who hunted about 100 deer during 80's decades. Besides, wildlife species, like snakes, foxes, pangolin, elephant etc are killed when these are encountered by local people. There is a serious lack of awareness about the conservation of wildlife.

#### IV. SUMMARY AND RECOMMENDATIONS

- A. Poor forest management by the FD has been identified as one of the major causes for the forest degradation. Therefore, there is an urgent need to strengthen the local FD in the Sanctuary with adequate and skilled manpower and to capacitate them in dealing with co-management of Protected Areas. Specifically the FD may strongly consider the following: - adequate

staffing, particularly for forest patrol under a skilled PA management manager

- a. Capacity building training for all local forest managers on sustainable management of forest resources and biodiversity conservation
  - b. Providing appropriate logistics, like vehicle and modern arms and ammunitions for local FD
  - c. Provision for providing incentives to local FD staff to make the job lucrative
  - d. Steps for improving the morale of FD local staff and make them dedicated to biodiversity conservation
  - e. Erection of fencing at strategic places of the park
  - f. Provision for strong monitoring and supervision of local activities by a central cell.
- B. Fuelwood and bamboo collection should be stopped but may not be a success as long as there is a scarcity of its
  - C. Supplies remain in the area. Therefore, project should strongly consider the following:
    - establishment of a buffer sustainable resource use zone around the PA with provision for fuelwood plot, woodlot and other plantations required for house building purposes
    - a. providing resource substitution (for example, commercialization of fuel made of rice husk and others)
    - b. promotion of fuel efficient stoves in the locality - cultivation of Dhancha sticks to substitute molibash to be used in betel leaf bed - promotion of homestead plantation
  - D. There is an urgent need to strengthening the local FD at the sanctuary with adequate and skilled manpower and to capacitate them in dealing with co-management of Protected Areas. Logistical support, like vehicle and modern arms and ammunitions should be ensured. A strong administrative support from the higher authority needs to be extended to the local staff, particularly in case of dealing with forest cases and local notorious people. A mechanism for providing incentive to local managers to make their job lucrative. Staff posted in PA should be transferred only between the PAs. Steps should be taken to improve the morale of local FD staff and make them dedicated to the cause of biodiversity conservation. Strong monitoring and supervision of local activities should be ensured by a central cell.
  - E. Appropriate, site specific and technically sound management Action Plans should be developed with consultation of local people. The action plan, among others, should have the following provisions: - a plan of actions for re-introduction and rehabilitation of endangered plants and animals species
    - a. a plan of actions for habitat restoration and rehabilitation
    - b. a plan of actions for protection and sustainable uses of forest biodiversity

- F. Betel leaf cultivation should be stopped within the sanctuary area. As it has emerged as an alternate source of income generation to the local people, this may be rehabilitated to some buffer zone areas with provision for resource substitution for materials for support, shade and fencing.
- G. Forest villager's agreement should be reviewed and renegotiated with valid forest villagers. The encroachers should be rehabilitated outside of the sanctuary area with proper support for AIG.
- H. Poor resource users should be identified and brought under AIG program with provision that they give up the unsustainable use of forest resources.
- I. Provision for habitat restoration through forest regeneration for such a degraded forest like Chunati may not be adequate. Extensive plantation program with multispecies indigenous timber and fruit bearing trees should be considered.
- J. Steps should be taken to recover FD's lost land and to this end some pragmatic and feasible trade-off policy should be sought. This may include, among others, adoption of policy like FD's existing social forestry with high valued timber trees.

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